Diameter of Bulb 0·58 in.

1¼ inch tube.			Zenith distance.	3 inch tube.			Zenith distance
Sun.	Fluid.	Diff.		Sun.	Fluid.	Diff.	
Fah.	Fah.	Fah.	° ′	Fah.	Fah.	Fah.	° ′
83·6	62·6	21	49 54	79·2	60·1	19·1	50 32
85·5	63	22·5	50 3	81	60·3	20·7	50 24
86·4	63·4	23	50 12	82·5	60·7	21·8	50 16
86·7	63·5	23·2	50 21	82·7	60·7	22	50 8
87·7	63·7	23	50 30	83	61	22	50 1
85·9	63·2	22·5	50 12	81·7	60·6	21·1	50 16

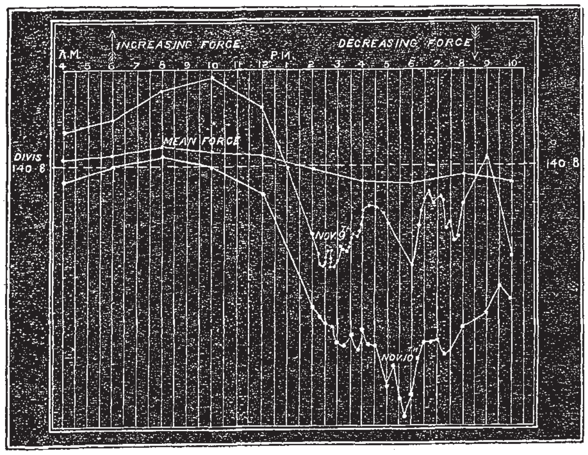
J. ERICSSON

MAGNETICAL AND METEOROLOGICAL OBSERVATIONS AT HAVANA

ON the 9th and 10th day of November I noticed on my instruments two strong magnetic perturbations, during which a series of extraordinary observations was taken at intervals of five, of ten, and fifteen minutes. From these I was naturally drawn to think that an aurora borealis would be seen in higher latitudes, and was waiting for a confirmation of my views.

This I found in the numbers 16th and 23rd of November of your scientific journal, NATURE, which I have just received, and in which I see with great pleasure the description of the aurora borealis seen in England on the 9th and 10th of November in perfect accordance with my observations of those days.

Curves of the Horizontal Magnetic Force on the 9th and 10th days of November, 1871, compared with the Mean Force of the whole month.



SCALE { 1 *hour* = 0^m ·01 *in the line of the abscissæ*
5 *division of the scale of the Bifilar Magnetometer* = 0^m ·01 *in the line of the ordinates.*

Each one of these divisions of the scale corresponds in parts of horizontal force to K = 0·000099573.

As it will not be devoid of interest to know to what an extent an aurora borealis, when seen in England, exerts its influence on the magnetic variations of a place situated in the Tropics and in very remote longitude, I take the liberty of sending you the curves of the horizontal magnetic force as registered by the bifilar magnetometer on the 9th and 10th of November, together with the curve of the mean horizontal force of the whole month. A comparison between them and those taken in other places will be, I hope, very pleasant to those who are interested in magnetic researches.

My observations on the bifilar magnetometer are reduced to the temperature of 77° Fah. The variation of the thermometer attached to it was 0°·8 during the whole perturbation.

The magnetic instruments I make use of are those of the Observatory of Makerston, Scotland, which were arranged and sent many years ago to this Observatory by order of General Sabine at the request of P. Secchi, of the Roman Observatory.

Another perturbation, although not so intense as those already described, was observed on the 2nd of November. It began at ten o'clock in the morning, and lasted the whole day.

A very remarkable one was also observed on the 17th and 18th of June; it began at ten o'clock in the evening of the 17th.

On the 21st of August, while a hurricane was felt in St. Thomas, and an aurora borealis seen from the Observatory of Dun Echt, Aberdeen, I noticed an extraordinary variation, which attained its maximum between four and six o'clock in the afternoon. A similar one occurred on the 24th.

Finally, on the 16th and 17th of August two great hurricanes swept the shores of Florida, and their influence upon the magnetic force can be perfectly noticed on the curves of those days.

BENEDICT VINES

Havana, Dec. 21, 1871

NOTES

WE alluded some time since to the threatened destruction of one of the most notable megalithic monuments in this country, the Great Circle at Avebury, in Wiltshire. All archæologists will be glad to hear that Sir John Lubbock has added one more to his eminent services to science by the purchase of the site on which the Circle stands. It is right also that the meed of praise should be awarded to those of the residents in the district whose zeal has been directed towards the attainment of this object; and who have thus shown their sense of the value of the monument which is one of the glories of their county. We refer especially to the Rev. Bryan King, the vicar of the parish, Mr. Kemm, Mr. George Brown, and the Rev. Alfred Charles Smith, Hon. Secretary of the Wiltshire Archæological and Natural History Society. It is to be hoped that their example will stimulate similar zeal for the preservation of monuments in other parts of the country.

DR. T. STERRY HUNT, chemist to the Canadian Geological Survey, has been appointed to the chair of Geology in the Massachusetts Institute of Technology.

MR. HENSMAN has been appointed Lecturer on Botany at the Middlesex Hospital, in the place of Dr. T. S. Cobbold, F.R.S., who has received the appointment of Lecturer on Parasitic Diseases.

AT the meeting of the Royal Geographical Society on Monday evening last, Sir Henry Rawlinson, the President, announced that the vessel with the Livingstone Expedition on board arrived at Malta on the 23rd inst., and was to reach Port Said on Sunday, and leave Suez on Monday night. By the accounts to hand all on board were pronounced to be well, and in the highest spirits. The finances of the expedition were in a highly satisfactory state, many contributions being remarkably striking, as showing the great interest taken in the enterprise not only in this, but in many distant countries. A contribution of 100 guineas had been received from a former member at Stockholm, who had always taken a deep interest in the travels and discoveries of Dr. Livingstone. The Italian Royal Geographical Society had also sent a contribution of 15*l.* 15*s.*, while national committees to assist the fund had been formed in Scotland and Ireland, who were working most energetically. The town of Glasgow has subscribed 1,000*l.*, Edinburgh 400*l.*, and Dublin promised to be equally generous. Similar interest had been awakened in Chicago, whence 100*l.* had come in to be placed at the disposal of the Livingstone Expedition; and on the whole it might be said the announcement of the undertaking had been hailed with general satisfaction throughout the civilised world. Exclusive of two sums of 400*l.* and 600*l.* odd, the latter the balance of the former Government grant, there was now standing to the credit of the expedition a sum of 4,200*l.*

THE following gentlemen were on Saturday last elected to Junior Studentships in Natural Science at Christchurch, Oxford:—Mr. D. A. Greswell, Commoner of Balliol College, Mr. B. Hainsworth, of Manchester Grammar School, Mr. W. A. Smith, of Clifton College. These scholarships are of the annual value of 75*l.*, together with the rooms rent free.

AT the examination recently concluded at the Melbourne University, there were no less than 225 competitors, of whom 86 passed the matriculation examination, and 108 the civil service examination. Many of the names in the former were included in the latter, but on the other hand, there were some who passed the larger, the matriculation examination, who did not pass the smaller examination, that for the civil service. The reason is, that for the matriculation any six subjects serve to qualify, while for the civil service, of the four subjects, two given ones are essential. The examinations this time had a novel feature, from there being three lady candidates, all of whom passed. The Council of the University, however, has passed a resolution to the effect that the successful ladies should not be allowed to matriculate. No reasons have been given for this decision, but it is presumed that the obstacle is a legal one.

THE *Academy* states that the President of the Geographical Society of Italy has written to the papers to say that the Conservator of the Bibliothèque Royale of Belgium has discovered a MS., in twelve chapters, containing the original autograph account of the discovery of Australia by Manuel Godinho, a Portuguese navigator, who touched there in 1601, and whose priority to the Dutch sailors, who arrived three or four years later, has been unduly neglected. Mr. Ruelens vouches for the authenticity of the MS., which was brought to light at the Antwerp Exhibition, though it passed unnoticed in the crowd.

PROF. CLEVELAND ABBE, in an article entitled "Historical Note on the Method of Least Squares," in the American Journal of Science and Arts, shows that this method, though first published in a printed form by Le Gendre in 1806, and invented by Gauss in 1795, was published in 1808 by Prof. Robert Adrain, at that time in New Brunswick, N. J., in the "Analyst," he having been independently led to this invention by the study of a prize problem offered some months previously in that periodical.

AN important addition has been made to the list of works devoted to inquiries and instructions in regard to the great fisheries in the form of a paper, by M. Achille Costa, upon the fisheries of the Gulf of Naples, published by the Royal Institute for the Encouragement of Natural Science, &c., of Naples. The subject is treated under four heads: first, a description of the various modes by which fishing is prosecuted in the Gulf of Naples, whether commendable or otherwise, with engravings of the nets and other apparatus used; second, the consideration of the various modes of fishing, and their relationship to the present and prospective supply; third, memoranda in regard to the localities in which the different kinds of fish and other marine animals are to be found, and the favourite places for depositing their spawn; and fourth, a systematic catalogue of the different species of marine animals found in the Gulf of Naples, and gathered for the purpose of serving as food.

PROF. MARSH reports to the *American Journal of Science* the discovery, during his explorations in 1871, of a remarkable fossil bird. It was found in the Upper Cretaceous of Western Kansas, and the remains consist of the greater portion of the skeleton, at least five feet in height, and which, although a true bird, as is shown by the vertebræ and other parts of the skeleton, differs widely from any known recent or extinct forms of that class, and affords a fine example of a comprehensive type. The bones are all well preserved. The femur is very short, but the other portions of the legs are quite elongated. The metatarsal bones appear to have been separated. On his return the professor proposes to describe this unique fossil under the name of *Hesperornis regalis.*

IN the expedition against the Losshais, who have attacked our tea plantations in Cachar, the interests of science have been cared for. Lieutenant Browne, 44th Foot, known in India as an able naturalist, has charge, with a trained native from the Indian Museum at Calcutta, to act as collector. Something is expected from the unexplored regions of the Losshai country.

HERR PAUSCH, a member of the late German polra expedition, recently made a communication to the German Anthropological Society in regard to certain abandoned habitations of the Esquimaux in East Greenland. He remarked that at each of seven different points they found three stone houses, some of them certainly over one hundred years old. These were winter huts, the remnants of their summer abodes being indicated by stone rings. In many places there were indications of stone graves, and from the skeletons found in them tolerably well-preserved crania were obtained, agreeing with the Eastern Esquimaux type as described by Virchow, and exhibiting the carnivorous habit in the highest degree. Remains of wood carving, tolerably well executed, occurred with the dead bodies, and in the heap were found bone knife-handles, harpoons of bone, arrow-tips, and even knife-shaped pieces of iron, probably obtained from the English expedition of 1823.

IN referring to the explorations of Dr. Hayden about the Yellow Stone Lake during the past summer, mention was made of the fact that the trout all seemed very much infested with a peculiar kind of worm, which interfered considerably with the enjoyment of eating them. Specimens of this animal have been submitted to Prof. Leidy, of Philadelphia, who reports that they represent a new species or type of worm, of the genus *Dibothrium.* Two species of the genus have long been known as infesting salmon and other members of the trout family in Europe, but both are decidedly different from the new form just mentioned.

THE Trustees of the Museum of Comparative Zoology at Harvard College, Cambridge, U.S.A., have issued their Annual Register for 1870, together with the Report of the Director, Prof. Agassiz. It is stated that the accessions to the Museum during the past year had been very great and of surpassing importance. Foremost stands Deyrolle's collection of Curculionidæ, presented by Mrs. A. Hemenway; next the collection of Galls of Baron d'Osten-Sacken, presented by him; then the magnificent collection of Fossil Plants of M. Lesquereux, especially remarkable for the exquisite selection of the specimens it contains, and that of Insects of Texas, made by Mr. J. Boll, both of which have been bought by the Museum; and not least the unparalleled collection of Neuroptera, brought to America by Dr. Hagen, and now deposited in the Museum. There are special reports on the Mammalia and Birds by Mr. J. A. Allen; on the Fishes by Dr. Franz Steindachner; on Conchology by J. G. Anthony; on the Articulata by Dr. Hagen; and on the Palæontological collections by Prof. Shaler, Mr. J. B. Perry, and Dr. G. A. Macak.

WE have received the Register of the Trustees, Officers, and Students of the Lehigh University, South Bethlehem, Penn., U.S., for the year 1871-72. The University was founded by a gift, in the year 1865, from the Hon. Asa Parker, of the sum of 500,000 dols., and a site of land containing 56 acres in the Lehigh Valley. The purpose of the founder was "to provide the means for imparting to young men of the valley, of the state, and of the country, a complete professional education, which should not only supply their general wants, but also fit them to take an immediate and active part in the practical and professional duties of the time. The system determined upon proposes to discard only what has been proved to be useless in the former systems, and to introduce those important branches which have been heretofore more or less neglected in what purports to be a liberal education, and especially those industrial pursuits which tend to develop the resources of the country,—pursuits, the paramount claims and inter-relations of which natural science is daily displaying—such as Engineering, Civil, Mechanical, and Mining; Chemistry, Metallurgy, Architecture, and Construction." For this purpose, special classes in all the above-named subjects have been instituted; and by the liberality of Robert H. Sayre, one of the trustees of the University, an Astronomical Observatory has been erected in the University grounds and placed under the care of the Professor of Mathematics and Astronomy, for instruction of students in Practical Astronomy. The Observatory contains an equatorial, by Alvan Clark, of six inches clear aperture, and of eight feet focus; a zenith sector, by Blunt; a superior astronomical clock, by William Bond and Sons; a meridian circle and a prismatic sectant, by Pistor and Martins.

DR. E. ASKENASY, in his "Beiträge zur Kritik der Darwinschen Lehre," contrasts the doctrine of Natural Selection as carried out to its full extent by Darwin in his "Origin of Species" and "Variation of Animals and Plants under Domestication," with the modified form of theory adopted by Nägeli in his "Conception and Origin of Species in Natural History."

THE first part of Dr. N. J. C. Müller's "Botanische Untersuchungen" treats of the separation of carbonic acid by the green parts of plants under the influence of sunlight, and is illustrated by a plate, delineating, in the form of curves, the effects of the different rays in the solar spectrum.

DR. GERARD KREFFT, in a paper on the Australian Vertebrata, Fossil and Recent, points out how valuable would be a general study of Natural History in a country like Australia, where every pool and creek teems with animal life, numerous mussels, various kinds of cray-fish, turtles, frogs, lizards, freshwater snakes, and other creatures, all of which are more nourishing to a starving human being than the wretched nardoo on which the lamented Burke and Wills tried to subsist. He advocates the establishment of district museums, and that the children should be taught to observe the habits and economy of different animals, in particular of those which are useful, by which means the wealth of the country would be much increased. Dr. Krefft promises hereafter a complete natural history of Australian Vertebrates, which will be the first ever published.

THE "American Horological Journal," published in New York, of which several numbers lie on our table, contains not only articles of special interest to manufacturers and vendors of clocks and watches, but others on Spectrum Analysis, and kindred scientific subjects.

"INDEX TO PRICES" is responsible for the following:—The demand for human hair is so great that it is impossible to supply it. Price has risen to 16*s.* a pound. As much as 1,000 dols. has been offered for a "head of hair" six feet long. Some ladies dress fifty to sixty miles of hair every morning.

AT the meeting of the Society of Arts held last week, Dr. Brands, Inspector-General of Forests to the Government of India, said that the cinchona plantations were now become almost forests. Before long they would be able to be coppiced every six or eight years, just as oak coppices were treated in Germany, Scotland, and elsewhere, every fifteenth or eighteenth year, and this would probably be the simplest and most profitable mode of getting the bark. The introduction of ipecacuanha into India was also alluded to. Dr. Masters expressed an opinion that there must be dozens, if not scores, of plants indigenous to that country, having the same medical properties as ipecacuanha, which could be much more easily utilised.

ACCORDING to the editor of the *Journal of Conchology*, of Paris, the Paris Museum received twenty-three shots from cannon of the German besiegers in the course of the siege, destroying many of the plant-houses. Two of these balls exploded in the conchological laboratory, in the care of Prof. Deshayes, causing great injury to the specimens, and the *Septaria* in the general collection were literally ground to powder. The large collection of shells of the lower sands of the Paris basin was entirely destroyed. This is much to be lamented in a scientific point of view, as it contained many types. A ball also passed through a glass case containing the Unios and Anodonta.

AT a late meeting of the State Dental Society of Pennsylvania one of the members, Dr. Barker, is reported in the *Dental Times* (July 1871) to have read an essay on Irregularity of Teeth, the circumstances favouring it, and suggestions on its prevention and treatment. The essayist held the opinion that a retrograde metamorphosis is going on in human teeth. To obviate this there must be improvement in the mode of living, the use of more substantial food, and from the time of the appearance of the deciduous teeth children should be under the care of an educated dentist; so that when the permanent teeth begin to erupt they may be properly guided, and a regular arch result. As a rule the first permanent molars should be extracted to make room for the succeeding teeth, for the jaws of the Anglo-Saxon race are shortening, and no longer have room for thirty-two teeth. How will this end?

ON January 28, the town of Schamachi, in the Caucasus, was totally destroyed by a succession of earthquakes. Few houses remain standing, and many lives have been lost.

A CORRESPONDENT of the *Globe* writes to say that the recent intelligence, describing the total destruction of the city of Oran in Chilé by an earthquake, must be a mistake. He says, that the city of Oran in the province of Salta, in the Argentine Confederation, was destroyed by an earthquake, on October 22, last year, but very few lives were lost. This is the earthquake referred to in NATURE (p. 251), but the date was there wrongly given as November 15.

BETWEEN ten and eleven at night, on December 12, two shocks of earthquake were felt at Serampore, in quick succession. The second and the strongest lasted about ten seconds, and seemed to move from north to south. The vibrations were very strong, but no great amount of damage was done.

THE Rangoon Mail states that on the night of December 12, an earthquake which lasted about ten seconds was felt at Prome. The wave appeared to travel from north-east to south-west. The shocks were stated to be severe, and followed in quick succession, but no damage is reported in the town. The earthquake occurred on the night of the new moon. A letter received from Herzadak states that an earthquake was felt there on the same night. In another paragraph we give an account of an earthquake felt at the same time at Serampore.

ON the 12th of December at 10.5 P.M. an earthquake was felt at Calcutta with a shock lasting eight seconds, and moving from east to west. It was felt at Ducca about the same time, but its direction was considered to be from north to south. It was also felt at Akyab and in Burmah.